

(No Model.)

W. L. SAUNDERS.

SAND AND WATER FEED MECHANISM FOR STONE SAWING MACHINES.

No. 315,171.

Patented Apr. 7, 1885.

Fig. 1.

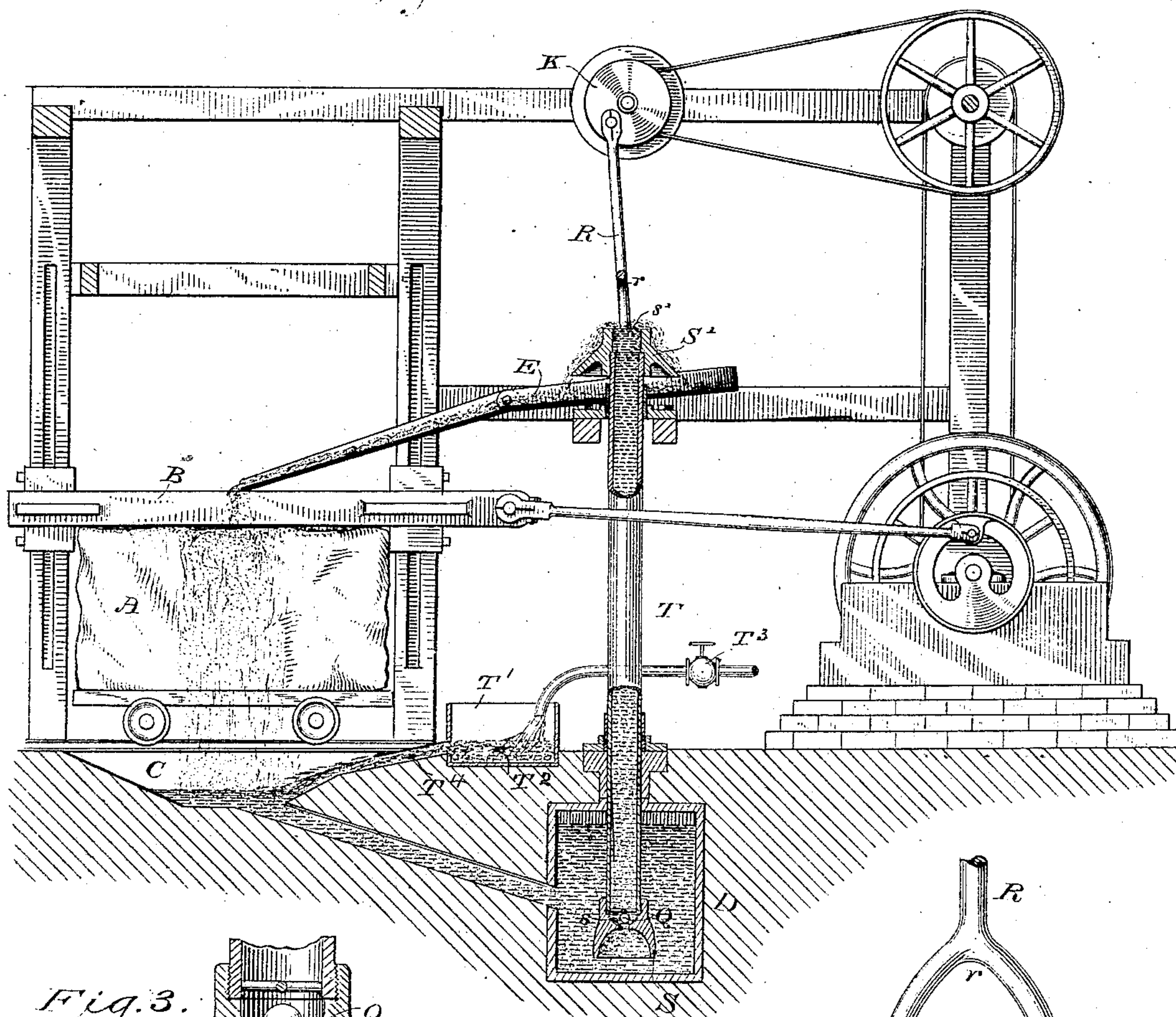


Fig. 3.

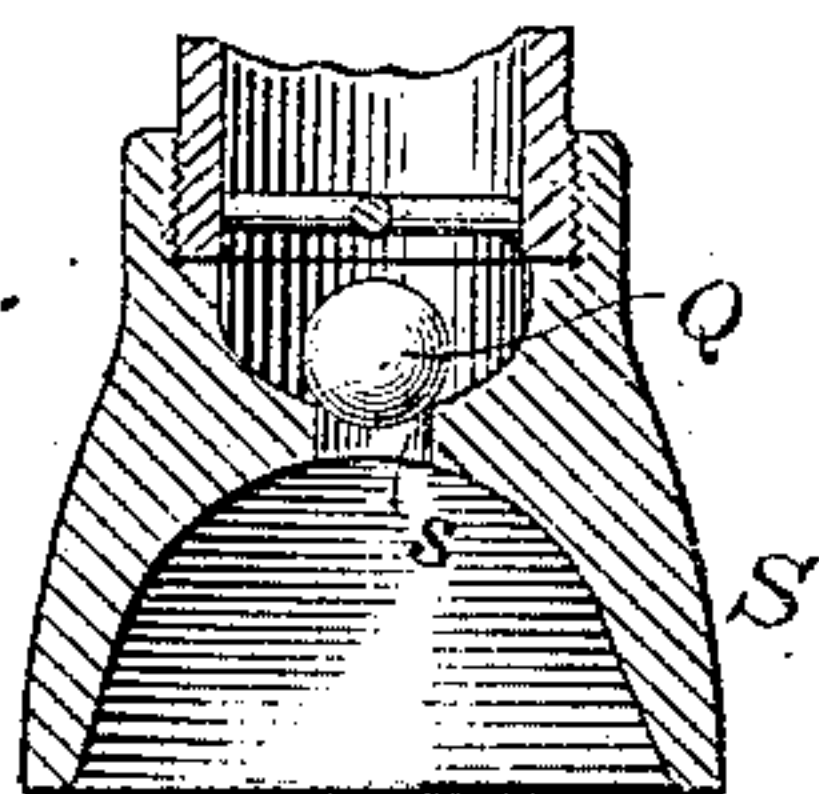


Fig. 4.

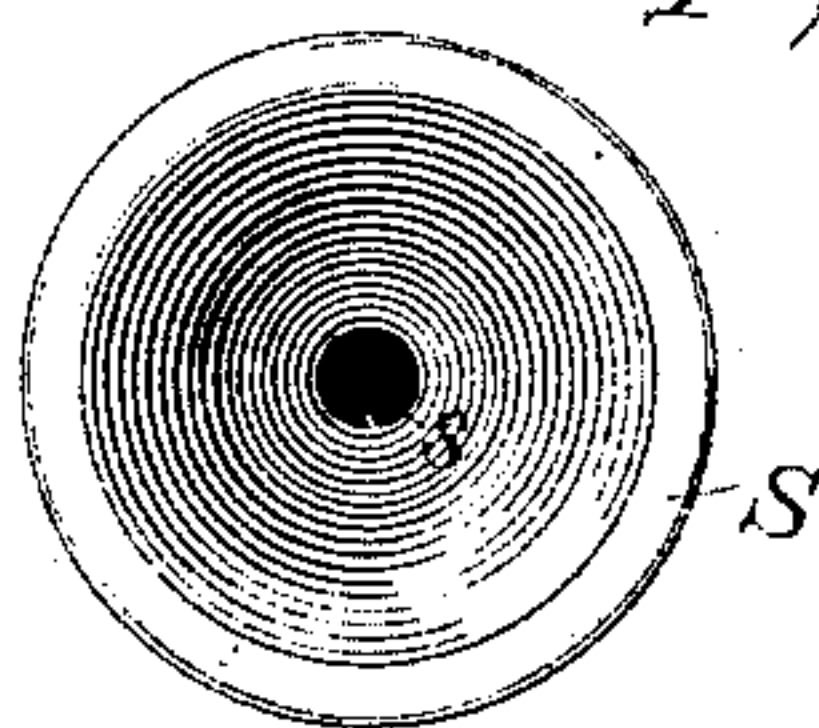
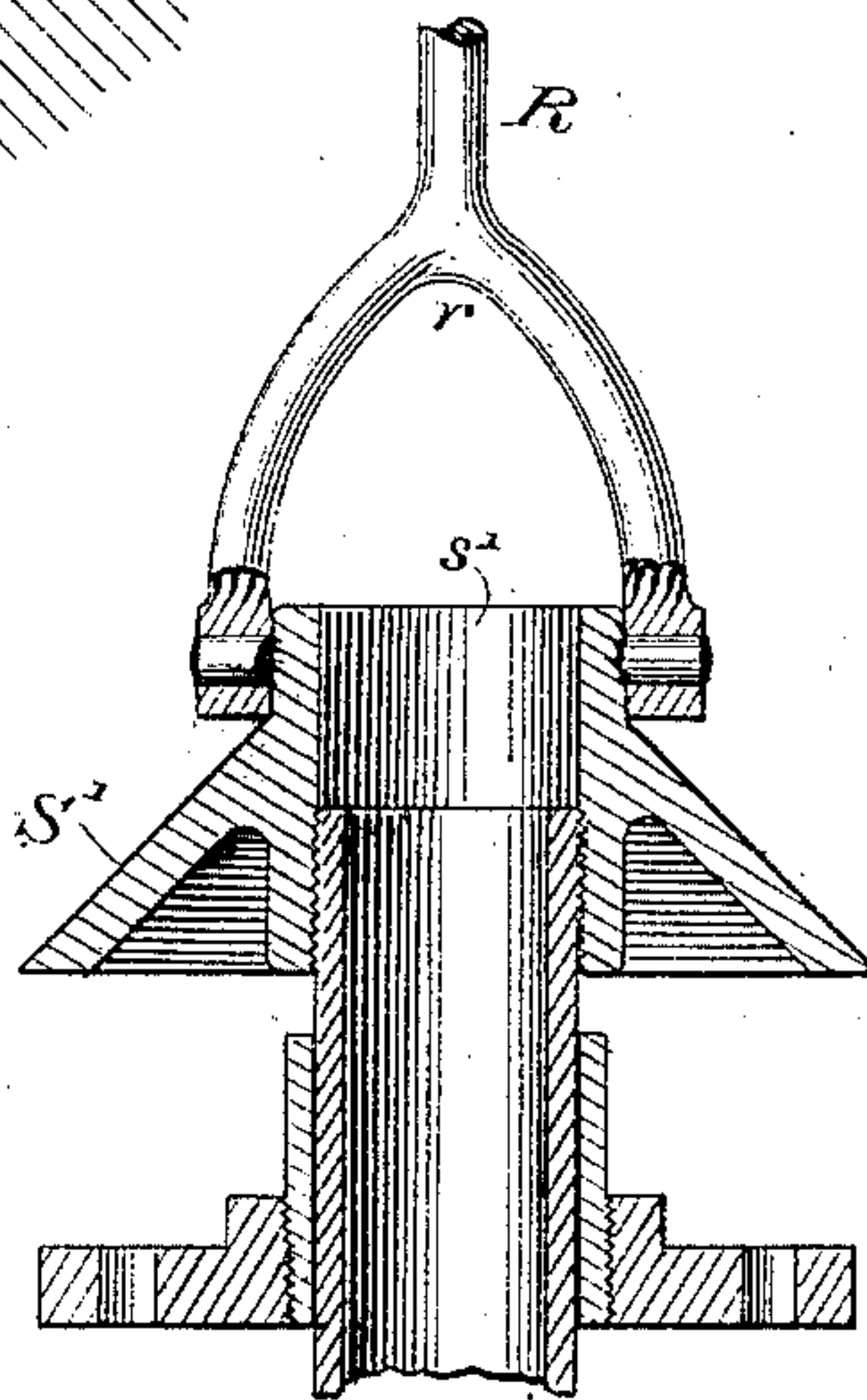


Fig. 2.



Witnesses

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SAND AND WATER FEED MECHANISM FOR STONE-SAWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 315,171, dated April 7, 1885.

Application filed November 17, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. SAUNDERS, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Sand and Water Feed Mechanism for Stone-Sawing Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to that class of machinery employed in stone-sawing where toothless metallic blades or saws are given a reciprocating motion over the stone and the cut constantly supplied with sand and water in mixture, whereby the stone is abraded or cut away. It is also applicable to machines for grinding or polishing the surface of a block of stone.

The object of my invention is to provide a means for automatically supplying the sand-and-water mixture to the stone, said supply being taken from the drain beneath the stone, thus keeping up a constant supply of the same mixture; and it consists in an improved pump and connections, whereby said sand and water is constantly agitated, and thereby kept in suspension during its course.

Considerable difficulty has been experienced with pumps of the ordinary construction when employed for this purpose, as, the mixture being heavy with sand and ground stone, the valves become clogged and act only imperfectly, the piston and pump are worn away by the hard mixture, and the sand is kept in but imperfect suspension in the water. The last-mentioned difficulty is the most serious, for the reason that clear or nearly clear water fed into the cut in the stone will not accomplish the desired results, a mixture of some heavy gritty substance therewith being absolutely necessary.

In the drawings hereto annexed, and forming part of this specification, Figure 1 is a view in elevation and partly in section of a stone-sawing machine embodying my improvements. Fig. 2 is a sectional elevation of the discharging end of the sand-pump. Figs. 3 and 4 are detailed views of the lower portion and foot-valve of the pump.

Like letters of reference have been applied

to similar parts throughout the several figures of the drawings.

A is a piece or block of stone, upon which the saw B is caused to reciprocate by any well-known means. Underneath this block is a drain, C, in which the water and sand are collected as they run from the stone. A suitable trough conveys this mixture to the tank D, from which it is elevated to the supply-hopper E, whence another suitable trough conveys it back to the saw, and it again passes through the same course. A supply of sand and water sufficient to compensate for waste is furnished from the box T', which communicates with the drip-trough C by pipe T¹, and contains a supply of sand, T², which is stirred up by suitable jet of water from pipe T³, by which it is washed into the said receiving-trough, whence it passes to the tank D.

The means for elevating the mixture from the tank D to the supply-hopper E form the subject-matter of the present invention, and are as follows: Mounted in suitable guides, G, is a vertical tube, T, extending from within the tank D through a central aperture in the hopper E to a point some distance above. This tube T is supported by a rod, R, forked at its lower end at r, and pivoted to the tube on opposite sides. The upper end of rod R is pivoted to a crank, K, which latter is revolved by any suitable mechanism. The lower or submerged end of tube T carries a bell, S, of a size found most practicable, and over a hole, s, in the top of this bell I locate a valve free to move upwardly, but closing in the opposite direction. Any suitable form of valve may be here employed; but in practice I find the following form to be best adapted for use and less liable to clog up or wear. A heavy ball, Q, of smaller size than the interior of tube T, but larger than an aperture, s, rests normally upon and closes said aperture. A suitable stop prevents too great rise of this ball in the tube T. The upper end of said tube T carries a second bell, S', mounted thereon, its aperture s', however, being of the same size as the interior of the tube, the purpose of which is to cause the mixture forced up tube T to be more thoroughly diffused and separated, and being at the same time thoroughly agitated,

the mixture, being spread over an extended and sharply-inclined surface, is less liable to settle and clog than if it were permitted to simply flow out of the tube and down its sides into hopper E. It also prevents the grit from working down the pipe and through its bearings.

The operation of my device is as follows: When the saw is set in motion by means of suitable belt or gearing, the crank K is rotated and tube T given a reciprocating motion through rod or pitman R. The downward thrust of this tube forces ball Q upward, not only by pressure against the liquid in the tank, but also partly by its inertia, and a quantity of the sand-and-water mixture is received in the tube. The following upward impulse closes the valve formed by the ball and aperture s, and carries the load in the tube up the distance of the thrust. This operation being rapid and continuous, a stream of the mixture is caused to flow up the tube and to pour over the bell S'. The rapid movement of bell S within the tank thoroughly agitates the liquid therein, and thus keeps the sand and powdered stone in more perfect suspension, which is especially desirable.

I claim as my invention—

1. In a stone-cutting machine, the combination, with a stone-saw and mechanism for op-

erating the same, of a hopper and discharge-way adapted to collect and convey the sand and water running from the stone, an automatically-operated reciprocating pump for elevating the collected sand and water, a trough leading from the pump to the saw, and a distributing device carried by the pump and adapted to prevent the settling and clogging of the material discharged thereby, substantially as described.

2. In a stone-sawing machine, the combination of a sand-and-water-discharge way and collecting-tank, a reciprocating tube provided at its lower end with an upwardly-opening foot-valve located within said tank, (whereby the contents thereof are continually agitated,) and at its upper end with a discharge-surface, whereby the mixture is prevented from settling and clogging, a suitable conduit for receiving and conveying the mixture to the stone, and mechanical connections, substantially as described, for imparting motion to the tube.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM L. SAUNDERS.

Witnesses:

F. M. PIERCE,

EDGAR INGRAHAM.